1.0 INTRODUCTION

1.1 Authorization

EnviroTrac Ltd. (EnviroTrac) prepared this Phase V Remedy Operating Status (ROS) Status and Remedial Monitoring Report (RMR) on behalf of Sunoco, Inc. (R&M) (Sunoco). This report presents information related to the operation, maintenance, and/or monitoring of the Comprehensive Remedial Action (CRA) implemented at the site identified by Massachusetts Department of Environmental Protection (MassDEP) with Release Tracking Number (RTN) 2-10259 and Tier IB Permit No. 91249. This document summarizes activities conducted at the site between December 8, 2007 and June 30, 2008.

1.2 Purpose

In accordance with the Massachusetts Contingency Plan (MCP) as set forth at 310 CMR 40.0983(2), this report was prepared as a Status Report to maintain ROS. Pursuant 310 CMR 40.0892 and 40.0893(e), this report discusses the type, frequency, modifications, conditions, problems, measures, and sampling conducted with regard to Monitored Natural Attenuation (MNA), the CRA implemented at the site.

1.3 Background

For the purpose of this report, the "facility" is defined as the area located within the legal property boundaries of 336 Great Road in Acton, Massachusetts. The "disposal site" or "site" is defined as the facility and other properties where oil and/or hazardous material (OHM) has come to be located as a result of the release at the facility. Based on data collected to date, the disposal site consists of the facility and a portion of the abutting property south towards Nagog Brook. The Universal Transverse Mercator (UTM) coordinates of the site are 4,708,229 meters North and 301,116 meters East. The regional location of the site is depicted on **Figure 1**, and a Site Plan depicting pertinent site features is provided as **Figure 2**.

The facility is a Sunoco-branded service station located at the intersection of Great Road and Main Street in the Town of Acton, Massachusetts in an area of mixed commercial and residential use. An Area Map is provided as **Figure 3**.

Properties surrounding the disposal site include:

North: Intersection of Great Road and Main Street, beyond which is a Shell Service Station.
South: Wetlands and Nagog Brook
East: Great Road, beyond which is an athletic field.
West: Main Street, beyond which is a commercial building.

The facility is approximately 25,700 square feet in area. The building has an office area, a restroom, and two former service bays that are currently used for storage.

1.4 Release History

On August 24, 1992, Handex of New England (Handex) supervised the removal of a drywell and visually impacted soils from the rear of the service station building. Laboratory analysis of a composite soil sample collected from the base of the excavation at approximately 18 feet below grade surface (bgs) resulted in the detection of 84 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH), 0.56 mg/kg of tetrachloroethene, 0.043 mg/kg of trichloroethene, and 0.021 mg/kg of toluene. The location of the former drywell is depicted on **Figure 2**.

On November 19, 1993, following installation and sampling of six groundwater monitoring wells, laboratory analyses of groundwater samples resulted in the detection of tetrachloroethene and trichloroethene at levels exceeding applicable MCP Reportable Concentrations.

Notification of groundwater conditions, which constituted a 120-day notification criterion, was provided to MassDEP on March 17, 1994. Upon notification, MassDEP assigned RTN 2-10259 to the release.

In 1994, Sunoco submitted a Phase I Report and Tier Classification to MassDEP. Based on the Tier Classification, MassDEP issued Tier IC Permit Number 91249 to Sunoco.

During a groundwater monitoring event conducted on October 16, 1995, approximately two inches of gasoline, as a light, non-aqueous phase liquid (LNAPL), was identified in monitoring well GES-4. The presence of greater than one-half inch of LNAPL represented a 72-hour notification criterion. Upon verbal notification, MassDEP assigned RTN 2-10953 to the condition.

At time of notification, MassDEP verbally approved an Immediate Response Action (IRA) to abate a potential condition of Substantial Release Migration. The IRA consisted of underground storage tank (UST) system and dispenser line testing, inventory reconciliation, an Imminent Hazard Evaluation, and manual bailing of LNAPL from monitoring well GES-4. On October 18, 1995, the IRA was modified to include the implementation of groundwater extraction and treatment and soil vapor extraction/air sparging (SVE/AS). Upon application, a National Pollution Discharge Elimination System (NPDES) Permit Exclusion was issued by the U.S. Environmental Protection Agency (U.S. EPA) on October 20, 1995 for the discharge of treated water from a groundwater extraction and treatment system (GWETS).

Sunoco submitted a written IRA Plan to MassDEP on October 30, 1995. The plan described start-up and operation of the GWETS and SVE/AS system. MassDEP issued a written approval of the IRA Plan on November 6, 1995. The systems were installed and placed in operation.

Sunoco submitted an IRA Plan Modification to MassDEP on April 26, 1996 for the installation and operation of an oxygen injection system. Six injection points were installed in the wetland area adjacent to an interceptor trench. The oxygen injection system was installed and operation was initiated on June 30, 1996. Oxygen was injected to the subsurface using air sparge wells AS-1, AS-2, AS-3, AS-5, and AS-6 and a common trunk line to AS-4 and SP-1 through SP-6. On July 23, 1998, Sunoco submitted an IRA Plan Modification to MassDEP to terminate the operation of the oxygen injection system. The IRA Plan Modification was proposed on the basis that groundwater conditions had approached GW-1 standards and monitoring of static groundwater conditions was recommended to evaluate the need for further remedial actions. The operation of the oxygen injection system was terminated on September 18, 1998.

On May 28, 1997, Sunoco submitted an IRA Plan Modification to MassDEP to terminate the operation of the GWETS. The GWETS was shut down since LNAPL had not been observed since January 1996, and the influent concentrations of petroleum hydrocarbons had decreased by two to three orders of magnitude since system operation was initiated. The basis for the proposed shutdown was that concentrations of petroleum hydrocarbons in groundwater had been reduced to levels where pump-and-treat was no longer considered to be a beneficial and cost-effective means of remediation. The GWETS was in operation from April 4, 1996 to July 25, 1997. Approximately 4.65 million gallons of treated water was discharged to Nagog Brook. Approximately 40 gallons of recovered LNAPL was pumped to a holding tank for off-site disposal.

Sunoco submitted an IRA Completion Statement to MassDEP on March 8, 1999.

On September 9, 1996, Sunoco submitted a Tier I Minor Permit Modification to MassDEP, linking RTN 2-10953 to RTN 2-10259, and re-classifying the site as Tier IB based on an updated Numerical Ranking System analysis.

Sunoco submitted a Phase II Scope of Work (SOW) and a Phase II — Comprehensive Site Assessment (Phase II) to MassDEP on March 31, 1999 and February 2, 2000, respectively. Phase II activities included additional assessment of soil and groundwater beneath the site and the completion of a Method 1 Risk Characterization. The Phase II concluded that additional response actions were needed to achieve a condition of No Significant Risk (NSR).

Sunoco submitted a Phase III — Remedial Action Plan (RAP) to MassDEP on October 31, 2000. As documented in the Phase III RAP, MNA was selected as the CRA for attainment of a Permanent Solution.

Sunoco submitted a Phase IV Remedy Implementation Plan (RIP) to MassDEP on February 28, 2001. The Phase IV RIP proposed a groundwater monitoring plan and semi-annual reporting schedule was developed. Sunoco submitted a Phase V Status Report to MassDEP on October 30, 2001. Sunoco submitted Tier I Permit Extension requests to MassDEP in April 2000 and April 2002.

The site attained ROS on July 23, 2004. Sunoco submitted periodic status reports documenting groundwater monitoring data to MassDEP through July 2007.

As stated in the Phase V ROS Status Report and RMR submitted by Sunoco to MassDEP on July 14, 2006, the Bylaws of the Town of Acton (updated April 2005) adopted Maximum Contaminant Level Goals (MCLGs) established in 40 CFR 141.50-141.52 as groundwater cleanup standards. Where the MCLG is zero, or for specific contaminants where no MCLG has been promulgated, the Bylaws set the town groundwater standard as 1 part per billion (ppb), which is essentially equivalent to 1 microgram per liter (µg/L). An additional standard of 5 ppb of total volatile organic compounds (VOCs) in groundwater was also established. The Acton groundwater standards are applicable to the site due to its location within a Zone II of a public water supply well.

In consideration of the foregoing, and based on a review of groundwater analytical data collected between 2003 and 2006, EnviroTrac proposed a modification to the groundwater monitoring program in the July 2006 Phase V ROS Status Report and RMR. To meet detection limits (to the extent possible) consistent with Town of Acton groundwater cleanup standards, groundwater samples collected from select monitoring wells are analyzed for VPH by MassDEP Method VPH-04-1.1 and VOCs by EPA Method 524.2.

EnviroTrac reviewed groundwater analytical data collected between 2003 and July 2006. Several wells within and upgradient of the zone of contamination that were included in the sampling program (GES-1, GES-5, and PZ-7), showed no detection of VPH between 2003 and 2006, and were therefore excluded from further monitoring for VPH.

2.0 REMEDIAL MONITORING REPORT

2.1 Type and Frequency of Inspections Conducted

EnviroTrac conducted a groundwater monitoring event on March 21, 2008. During the monitoring event, the depth to the water table, dissolved oxygen (DO), pH, temperature, oxygen reduction potential (ORP) and conductivity were measured in select monitoring wells, and groundwater samples were obtained for analysis. The samples were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for volatile petroleum hydrocarbon (VPH) analysis. Select samples were also submitted for MNA parameters (dissolved iron, dissolved manganese, alkalinity, sulfate, sulfide, nitrate, and nitrite) and VOC analysis by EPA Method 524.2 during the March 2008 sampling event (to meet detection limits to the extent possible consistent with Town of Acton groundwater cleanup standards). Results of the March 2008 groundwater monitoring event are discussed in **Section 2.5**.

Current and historical groundwater gauging and analytical data are summarized in **Tables 1 through 3**. A copy of the laboratory report for the March 2008 groundwater monitoring event is provided in **Attachment A**.

2.2 Significant Modifications Initiated

No significant modifications of the CRA were initiated during this reporting period.

2.3 Conditions and/or Problems Affecting Remedial Action Performance

No conditions affecting the performance of the CRA were noted during this reporting period.

2.4 Measure Taken To Correct Conditions and/or Problems

No corrective actions of the CRA were required during this reporting period.

2.5 Analytical Data

At monitoring well GES-4, contaminants of concern (COCs), including benzene, toluene, ethylbenzene, xylenes, naphthalene, and VPH constituents (C5-C8 aliphatics and C9-C10 aromatics) were detected at concentrations above MCP Method 1 standards during the March 2008 event. The VPH constituent C9-C10 aromatics was also detected above the Method 1 GW-1 standard during the March 2008 event. In addition, as shown on **Tables 2 and 3**, the following exceedences of Town of Acton standards were detected: benzene, toluene, ethylbenzene, and naphthalene in GES-4 and acetone, cis-1,2-dichloroethene and vinyl chloride in MW-3D.

Dissolved iron and manganese concentrations detected in groundwater analyzed from GES-4 and MW-3D indicate higher levels than detected in other wells during previous sampling events. In addition, nitrate concentrations in groundwater from GES-4 and MW-3D were detected at lower levels than previous monitoring events. Remaining MNA data collected during the March 2008 monitoring events were consistent with historical data.

Quality assurance and quality control (QA/QC) data included in the laboratory report meet the criteria set forth for presumptive certainty in the MassDEP Compendium of Analytical Methods (CAM), with the following exception:

- The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were slightly lower than the advisable quality control limits for the unadjusted C5-C8 aliphatics, and the MSD recoveries for the unadjusted C9-C12 aliphatics and the C9-C10 aromatics due to matrix interference. Since the negative bias is slight, the data are considered usable. A Laboratory Control Sample (LCS/LCSD) was analyzed as a quality control check for the analytical batch and all recoveries were within acceptable limits.

2.6 Proposed Modifications to the Comprehensive Remedial Action

No other modifications to the CRA are proposed at the time of submittal of this Phase V ROS Status Report and RMR.

2.7 Summary and Conclusions

Benzene, toluene, ethylbenzene, xylenes, naphthalene, and VPH constituents (C5-C8 aliphatics and C9-C10 aromatics) were detected at concentrations above MCP Method 1 GW-1 standards in groundwater during the March 2008 monitoring event. In addition, benzene, toluene, ethylbenzene, naphthalene, acetone, cis-1,2-dichloroethene, and vinyl chloride were detected at concentrations above Town of Acton groundwater cleanup standards in groundwater. DO levels in wells containing COCs above standards during the March 2008 monitoring event were lower than historical events. Groundwater monitoring will continue on a tri-annual basis.

2.8 Schedule

Groundwater Monitoring	July and November 2008
Phase V Status and Remedial Monitoring Report	January 23, 2009